

# Market of Phosphoric Acid in China

The First Edition

August 2023

**Researched & Prepared by:**

**Kcomber Inc.**

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## 1. Introduction

In China, many phosphoric acid (PA) manufacturers are traditional phosphorus chemical enterprises. But currently many of them no longer simply play the traditional role as a supplier of fertilizers or low-end phosphorus products. These years, they have made new development through following integration strategies.

Nowadays, PA manufacturers in China are developing not only by integrating forward, but also by integrating backward. Upstream material self-sufficiency rate in China's PA manufacturers is increasing. Many PA manufacturers have expanded or are actively expanding to downstream businesses. For instance, Kunming Chuan Jin Nuo Chemical Co., Ltd. will complete its 2,500 t/a battery-grade PA (100% P<sub>2</sub>O<sub>5</sub>) and 5,000 t/a battery-grade lithium iron phosphate precursor project in 2023, and Kingenta Norsterra Chemical Co., Ltd. expects to complete its 100,000 t/a purified PA, 200,000 t/a PA and 400,000 t/a ammonium dihydrogen phosphate for batteries project in 2025.

Then why do these PA manufacturers need to conduct industrial integration? What kinds of actions are they taking to implement their integration strategies? And how will China's PA industry fare after the industrial integration in the future?

In order to get more information and have a better knowledge of development trends of PA industry in China, CCM has done deep research on PA manufacturers, which include phosphorus fertilizer manufacturers, food grade PA manufacturers, industrial grade PA manufacturers and electronic grade PA manufacturers. CCM has also done deep research on PA downstream fields, including fertilizer, metal surface treatment, fire protection, new energy, panel, circuit and food processing. Key points in the report are as follows,

Production situation of PA in China, 2020–2022

Key PA manufacturers and their capacity and output, 2020–2022

Key PA manufacturers and their production methods

PA related subsidiaries of key PA manufacturers in China

Financial situation of key PA manufacturers in China

Backward integration trend of PA industry in China, 2018–2022

Forward integration trend and consumption analysis of PA industry in China to 2025

## 2. Approach for this report

The research for the report is carried out by the following steps:

### - Desk research

The sources of desk research are various, including published magazines, journals, government statistics, industrial statistics, customs statistics, association seminars as well as information from the Internet. A lot of work went into compiling and analysing the information obtained. Where necessary, checks were made with the Chinese suppliers regarding market information such as production, demand, consumption, competition, etc.

### - Telephone interview

The interviewees cover:

- Producers
- Phosphorous chemical experts
- Traders
- Local governments
- Researchers
- Associations
- Equipment suppliers
- Raw material suppliers

### - Data processing and presentation

The data collected and compiled are sourced from:

- Published articles from Chinese periodicals, magazines, journals, the third-party database
- Government statistics & customs statistics
- Telephone interviews with Chinese producers, traders, governments and farmers
- Comments from industrial experts
- CCM's database
- Professional database in other sources
- Information from the internet

The data from various ways have been combined to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions took place in order to analyse the data and draw conclusions from it.

### - Report generation

Logical analysis and ratiocination were conducted, such as supply & demand analysis and cross-checking of all data. All the data and findings obtained through the above methods will be presented in the report

clearly.

**- Glossary**

PA: Phosphoric acid

PPA: Purified phosphoric acid.

LFP: Lithium iron phosphate

USGS: United States Geological Survey

**- Unit**

RMB: currency unit in China, also called yuan

USD: currency unit in the US, also called US dollar

Tonne: equals to metric ton in this report

/t: per tonne

t/a: tonne/annual, tonne per year

t/d: tonne per day

*Source: The People's Bank of China*

### 3. Executive summary

These years, global production capacity for phosphoric acid (PA) has been on the rise, and China has been among the top players in terms of PA capacity. It is expected that global PA capacity will further increase, as governments around the world are paying great attention to food security in the midst of increasing global demand for food, and PA is an important link in the process.

In China, most of China's PA production capacity is distributed in regions such as Yunnan, Guizhou and Hubei, where there are abundant phosphate ore resources. Food grade, electronic grade and industrial grade PAs are commonly seen in China currently. The output of food grade PA in China was XXX,XXX tonnes in XXXX; it decreased slightly to XXX,XXX tonnes in XXXX, mainly due to a significant reduction in Jiangsu Chengxing Phosph-Chemicals Co., Ltd. In XXXX, the output jumped to XXX,XXX tonnes, partly due to an increase in food grade PA exports. The output electronic grade PA increased year by year during this period. From XXXX to XXXX, the output of industrial grade PA in China increased from some XX,XXX,XXX tonnes to about XX,XXX,XXX tonnes. In XXXX, the output decreased to XX,XXX,XXX tonnes, mainly due to a decrease in the output of PA for phosphate fertilizers.

Worthy to note that, integration degree of China's PA manufacturers is high at present. The backward integration of Chinese PA producers was deepening from XXXX to XXXX. That was because, on the one hand, some of the producers who own phosphate mines added new phosphate ore capacity to improve their phosphate ore self-sufficiency rate; on the other hand, due to the rising market price of phosphate ore, producers intended to lower production costs by cutting their purchases of phosphate ore.

PA companies are not only extending their reach to the upstream sectors but also to the downstream sectors, especially the wet-process PA producers who principally engage in the phosphate fertilizer business. Their business model is moving from "phosphate ore–PA–phosphate fertilizer" towards "phosphate ore–PA–phosphate fertilizer/phosphate", indicating the volume of self-used PA used by themselves PA is taking a bigger share.

China's market demand for phosphate fertilizers has remained intact. But the country's continued efforts to phase out backward phosphate fertilizer capacity in stages, any alterations in the national plantation structure and fertilization practices may bring down the overall domestic demand. The overall consumption of PA in China is projected to shrink to a certain level from XXXX to XXXX. It is worth noting that the newly added capacity for new energy materials could spark a hike in demand for phosphate ore and PA. Lithium iron phosphate (LFP) is an important cathode material of lithium battery. In addition, China's electronic grade PA capacity is estimated to reach XXX,XXX t/a in XXXX and stabilize at XXX,XXX t/a in XXXX and





XXXX, with consumption at a steady three-year CAGR (compound annual growth rate) of X.X%, rising from XXX,XXX tonnes in XXXX to XXX,XXX tonnes in XXXX.

#### 4. What is in the report?

Note: Key data/information in this sample page is hidden, while in the report it is not.

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#### 1.2.2 Properties of electronic grade PA

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Table 1.2.2-1 Standard for electronic grade phosphoric acid in China

No.	Item	Specification	
		XX XXXXXXXX	XX XXXXX XXXXXXXX
X	XXXXXXXXXXXX XXXX (H <sub>X</sub> PO <sub>X</sub> ) XXXXXX ω/%	85-87	85-87
X	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX H <sub>X</sub> PO <sub>X</sub> , ω/% ≤	XXXXX	XXXXX
X	Nitrate (NO <sub>X</sub> <sup>-</sup> ) / XXXXXXXX ≤	X	XXX
X	Sulfate (SO <sub>X</sub> <sup>2-</sup> ) / XXXXXXXX ≤	XX	X
X	Chloride (Cl <sup>-</sup> ) / XXXXXXXX ≤	X	XXX
X	XXX (μg/kg) ≤	XXX	XX
X	XX (μg/kg) ≤	X	XX
X	XXX (μg/kg) ≤	X,000	XXX
X	XXX XXX XXX XXX XXX XXX XXX XXX XX XXX XXX (μg/kg) ≤	XXX	XX
XX	XXX (μg/kg) ≤	X,000	XX
XX	XXX (μg/kg) ≤	XX	XX
XX	XXX XXX XXX (μg/kg) ≤	XXX	XX
XX	XXX (μg/kg) ≤	XXX	XX
XX	XXX (μg/kg) ≤	XXX	XX

XX	XXX (μg/kg) ≤	X	XX
XX	XXX XXX (μg/kg) ≤	XXX	XX

Source: National Standard on Electronic Grade Phosphoric Acid (GB/T 28159-2011)

...

### 1.2.3 Properties of industrial grade PA

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At present, there are two ways to produce industrial grade PA in China: one is thermal process, and the other is wet purification process. Chinese producers mainly use thermal process.

With the vigorous development of new energy industry, lithium iron phosphate (LFP) battery will become the mainstream for a period of time, thus driving the growth of demand for industrial grade PA. In addition, many industrial grade PA producers in China have set on the path to refine their products, shifting from traditional bulk industrial grade ones to high value-added ones such as food grade, pharmaceutical grade, and electronic grade PAs.

...

### 2.1.2 Producers of food grade PA in China, 2020–2022

...

#### Jiangsu Chengxing Phosph-Chemicals Co., Ltd.

At present, Jiangsu Chengxing has yellow phosphorus production capacity of XXX,XXX t/a, PA production capacity of XXX,XXX t/a, and phosphate production capacity of XX,XXX t/a. The company has a yellow phosphorus production base in Yunnan, but its product deep processing bases are located in Jiangyin of Jiangsu and Qinzhou of Guangxi. Important subsidiaries of the company include Yunnan Xuanwei Phosphorus Electricity Co., Ltd., Guangxi Qinzhou Chengxing Chemical Technology Co., Ltd. (Qinzhou Chengxing), Jiangyin Chengxing Daily Chemical Co., Ltd., and Yunnan Mile Phosphorus Electricity Co., Ltd. In particular, Qinzhou Chengxing has XXX,XXX t/a capacity dedicated to food grade PA production. Currently, XX% of the company's phosphate ores come from self-produced sources.

Due to production suspension of in its Jiangsu base for a period of time in XXXX, its food grade PA output decreased to XX,XXX tonnes in XXXX. In XXXX, the output recovered to XXX,XXX tonnes.

...

### 2.2.1 Capacity and output of electronic grade PA, 2020–2022

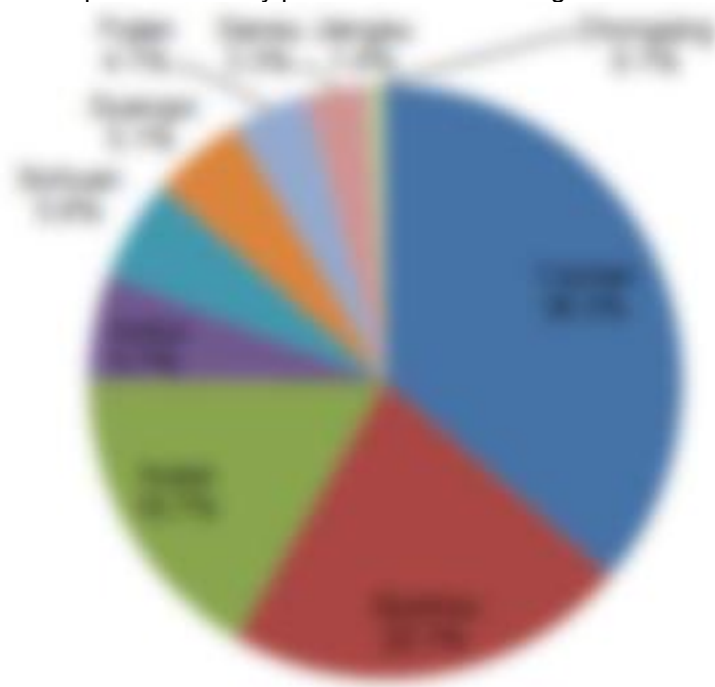
In China, the production capacity of electronic grade PA grew from XXX,XXX t/a in XXXX to XXX,XXX t/a in XXXX, and the output increased year by year during this period.

...

### 2.3.1 Capacity and output of industrial grade PA, 2020–2022

...

Figure 2.3.1-1 Output share of key producers of industrial grade PA in China by region, 2022



Source:CCM

### 2.3.2 Producers of industrial grade PA in China, 2020–2022

...

Table 2.3.2-1 Production technology adopted in major industrial grade PA producers in China

No.	Company	Technology
X	XXXXXXXXXX	XXX XXXXXXXX XXXXXXXX XXXXXXXX
X	XXXXXX XXXXX	XXX XXXXXXXX
X	XXXXXXX XXXXXXX	XXX XXXXXXXX
X	XXXXXX XXXXXXX	XXX XXXXXXXX
X	XXXXXX XXXXXXX	XXX XXXXXXXX
X	XXXXXX XXXXXXX	XXX XXXXXXXX XXXXXXXX XXXXXXXX
X	XXXXXXX XXXXXXXX	XXX XXXXXXXX
X	XXXXXXX XXXXX XXX XXX	XXX XXXXXXXX
X	XXXXXXXXXX XXXXXXXXXXXX	XXX XXXXXXXX XXXXXXXX XXXXXXXX
XX	XXXXXXX XXXXXXXXXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXXXXXXXX XXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXXXXXX XXXXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXXXXXX XXXXXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXX XXXXXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXXX XXXXXXX	XXX XXXXXXXX XXXXXXXX XXXXXXXX
XX	XXXXXXXXXX XXXXXXXXXXXX	XXXXXXXXX XXXXXXXX
XX	XXXXXXX XXXXXXX	XXXXXXXXX XXXXXXXX

Source:CCM

...

### 3.1 Industrial grade PA and food grade PA

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Among the industrial and food grade PA producers, nine producers have their own phosphate ore resources: Wengfu Group, Guizhou Kailin, Guizhou Chanhen, Yuntianhua, Hubei Xingfa, Hubei Yihua, Jiangsu Chengxing, Chongqing Chuandong and Yunnan Jianglin. Usually, these producers will first use their own phosphate ore to produce PA. But they will also purchase some phosphate ore from suppliers if different grades of phosphate ore are needed, or when the price of phosphate ore falls to a low level, so as to make good use of the phosphate ore resources.

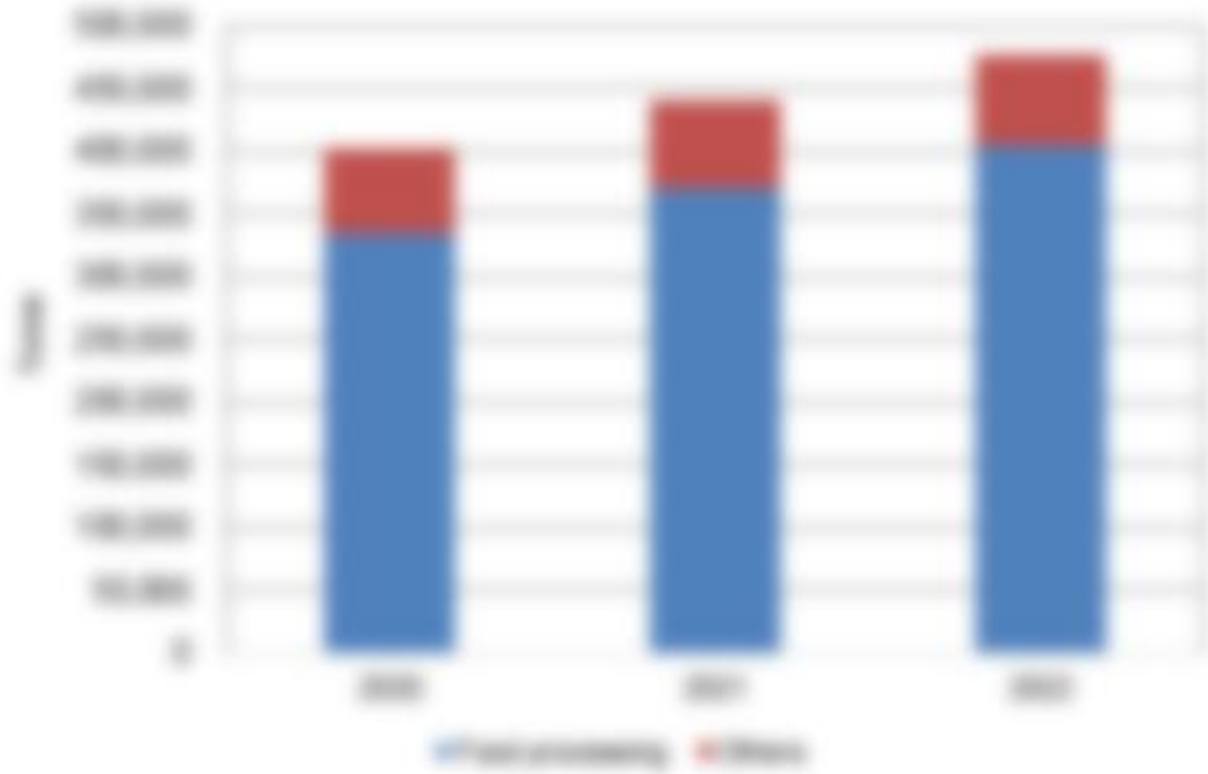
PA producers usually purchase phosphate ores mined nearby. High-grade phosphate ore is mainly concentrated in Guizhou, Yunnan and Hubei provinces where wet process PA producers buy their raw material. While thermal process PA producers also purchase phosphate ore from other provinces, or they buy yellow phosphorus to make PA. Four producers including Qinzhou Capital Success, Guizhou Sino-Phos, Shifang Qishan and SEMIAC Electronic purchase yellow phosphorus to produce PA.

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### 4.1 Consumption of food grade PA

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Figure 4.1-1 Consumption of food grade PA, 2020–2022



Note: Others include feed, chemical, medicine and other fields.  
Source:CCM

#### Applications in food processing

- As a food additive, PA can be used as an acidity regulator added to beverages and dairy products, serving as an alternative to citric acid and malic acid
- In the brewing industry as a yeast nutrient to inhibit the growth of miscellaneous bacteria, and to replace lactic acid for the adjustment of pH value during the beer saccharification
- As a flour improver
- As a blending agent for edible oil production
- In the sugar industry as a clarifier
- For the production of edible gelatin and various capsules
- Further processed into food grade phosphate

The end customers of food grade PA cover beverage, bakery, sugar, wine and oil products processors, such as the Coca-Cola Company, COFCO Corporation, Hangzhou Wahaha Group Co., Ltd.

#### Other applications

- For the production of calcium hydrogen phosphate, a feed nutrient
- In water treatment as a raw material for the production of water softener, descaling agent and phosphorus water treatment agent
- In the pharmaceutical industry, PA is used to produce sodium glycerophosphate, iron phosphate and

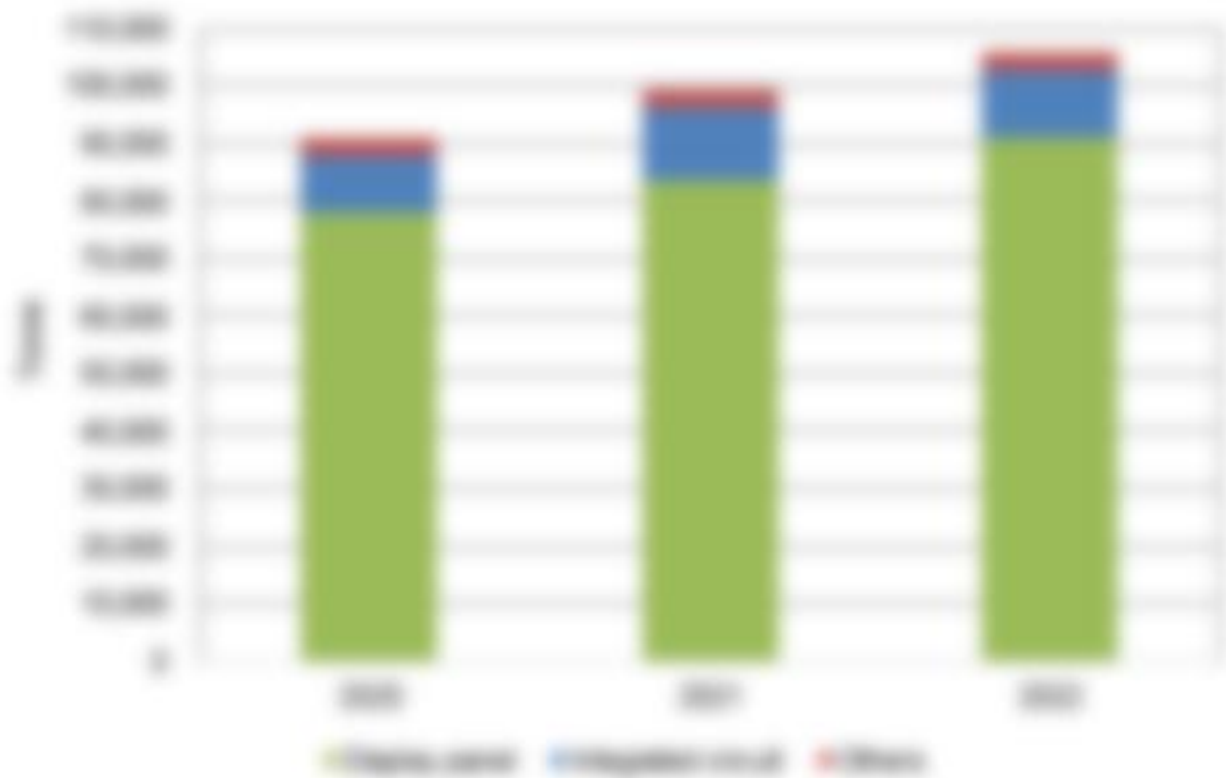
- zinc phosphate which is used as a dental cement
- Food grade purified PA can be used to produce general electronic chemicals

## 4.2 Consumption of electronic grade PA

As a fine phosphorus chemical product of high added value, electronic grade PA has widespread applications in integrated circuits and display panels. It is one of the main raw materials of electronic chemicals such as high-performance etching solutions, photoresist stripping solutions and cleaning solutions. From XXXX through XXXX, the consumption of electronic grade PA in China rose continuously from XX,XXX tonnes to XXX,XXX tonnes with a CAGR of X.X%.

End customers of electronic grade PA include large-scale integrated circuit manufacturers such as Yangtze Memory Technologies Co., Ltd., Shanghai Huahong (Group) Co., Ltd. and Semiconductor Manufacturing International Corporation, as well as electronic chemical manufacturers such as Shanghai Sanfuming Electronic Materials Co., Ltd., Jiangyin Jianghua Micro-electronic Materials Co., Ltd. and Jiangyin Runma Electronic Material Co., Ltd.

Figure 4.2-1 Consumption of electronic grade PA, 2020–2022



*Note: Other applications mainly include the production of high purity phosphate and glass fiber.  
Source:CCM*

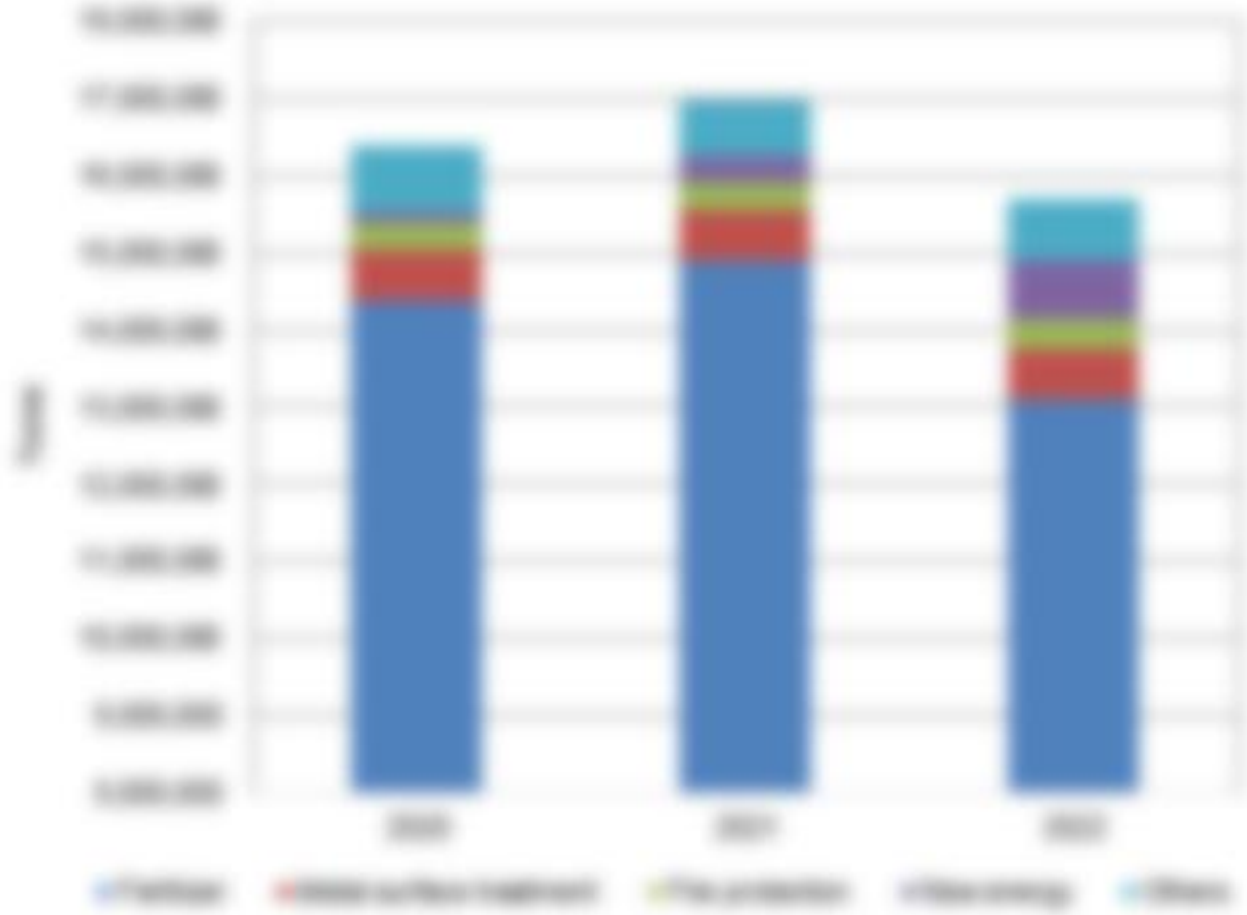
...



### 4.3 Consumption of industrial grade PA

...

Figure 4.3-1 Consumption of industrial grade PA, 2020–2022



Note: Other fields mainly refer to feed, chemical, metallurgy and medicine.  
Source: CCM

...

### 5.2 Forecast of electronic grade PA

China's electronic grade PA capacity is estimated to reach XXX,XXX t/a in XXXX and stabilize at XXX,XXX t/a in XXXX and XXXX, with consumption at a steady three-year compound annual growth rate of X.X%, rising from XXX,XXX tonnes in XXXX to XXX,XXX tonnes in XXXX.

Novel display, as one of the downstream application fields of electronic grade PA, is one of the fastest growing sectors in China in recent years, partially prompted by the country's endeavors to expand domestic demand to the level that has seldom been seen in other countries and has helped grow traditional applications such as smart phone, television and displayer. In XXXX, China's display industry absorbed increased amount of foreign investment facilitating the industry growth. Apart from the improvement in

market scaling, the industrial investment structure has seen positive changes: investment amount in materials surpassed that in devices for the first time, shifting largely from LCD to OLED, Micro LED and other upper-stream products. That has helped boost the consumption of electronic grade PA.

In integrated circuit (IC) area, China's policies to develop the national semiconductor industry have been carried out firmly: its XXth Five-year Development Plan (XXXX–XXXX) underscores structured development of the IC industry, and innovation and industrialization of semiconductor and other emerging fronts. In HX XXXX, overseas sales eased and domestic recovery slowed down. But even though the overall downstream demand has remained sluggish, expectation is that world economy will pick up gradually, and with government supports, the PA industry will be given more opportunities to boom.

Looking forward to the next three years, the development of China's electronic information manufacturing industry is expected to show a restorative growth trend, with the electronic grade PA market growing correspondingly and steadily.

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### 6.1 Yunnan Yuntianhua Co., Ltd.

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Table 6.1-1 PA capacity and output of Yuntianhua, 2020–2022

Item	2020	2021	2022
Total capacity, XXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXXXXXX XX XXXXXXXXXXXX XXXXX XXX XXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
XXXXXXXX XX XXXX XXXXX XXX XXXXX	XXXXXXX	XXXXXXX	XXXXXXX

Source:CCM

...

### 6.2 Wengfu (Group) Co., Ltd.

...

Address: No. XX, Shinan Road, Nanming District, Guiyang City, Guizhou Province

Tel: +XX-XXXX-XXXXXXXXXX

E-mail: wfdongban@XXX.com

Website: www.wengfu.com

Founded in XXXX, Wengfu (Group) Co., Ltd. (Wengfu Group) has over XX subsidiaries and five main production R&D bases located in Guizhou, Gansu, Sichuan and Fujian provinces. Currently, Wengfu Group has X,XXX,XXX t/a phosphate mining capacity, X,XXX,XXX t/a phosphate fertilizer production capacity, X,XXX,XXX t/a chemicals production capacity, etc.

Details of the group's five production bases are as follows:

- Fuquan City, Guizhou: As Wengfu Group's core base for production and R&D, the Fuquan base was completed and put into use in XXXX, covering an area of approximately X,XXX mu.
- Weng'an County, Guizhou: The Weng'an base has a phosphate mining capacity of X.X million t/a, and a yellow phosphorus production capacity of XX,XXX t/a which was completed in construction in XXXX.
- Shanghang County, Fujian: The Shanghang base (Wengfu Zijin Chemical Co., Ltd., established in May XXXX) was jointly funded by Wengfu Group, Zijin Copper Co., Ltd. and the Japan-based National Federation of Agricultural Cooperative Associations (or ZEN-NOH Group). It has formed production capacities of XXX,XXX t/a for compound phosphate fertilizers, XXX,XXX t/a for wet process purified phosphoric acid, XX,XXX t/a for ammonium phosphate, XX,XXX t/a for food grade potassium phosphate, etc.
- Dazhou City, Sichuan: Invested with more than RMBX billion, the Dazhou base produces sulfur-based sulfuric acids, phosphoric acids, wet purified phosphoric acids, diammonium phosphate, and phosphates of industrial grade, food grade and battery grade.
- Jinchang City, Gansu: The Jinchang base (Gansu Wengfu Chemical Co., Ltd., established in October XXXX), has formed mineral processing capacity of X.X million t/a and production capacities of XXX,XXX t/a for phosphoric acids, XXX,XXX t/a for ammonium phosphate, XXX,XXX t/a for compound fertilizers, etc.

...

**If you want more information, please feel free to contact us**

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